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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,492	03/18/2004	Raffaele Zambrano	854063.679D1	7636
500	7590	08/03/2005	EXAMINER	
SEED INTELLECTUAL PROPERTY LAW GROUP PLLC			NGUYEN, HA T	
701 FIFTH AVE			ART UNIT	
SUITE 6300			PAPER NUMBER	
SEATTLE, WA 98104-7092			2812	

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

*Supplemental*  
**Office Action Summary**

Application No.

10/804,492

Applicant(s)

ZAMBRANO ET AL.

Examiner

Ha T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-29 is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 30-33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Notice to applicant***

1a. Applicant's Amendment and Response to the Office Action mailed 1-25-5 has been entered and made of record.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 5, 11-12, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Layadi et al. (USPN 6,436,829, hereinafter "Layadi").

Referring to Figs. 2-5 and related text, Layadi discloses [Re claim 1] a process for manufacturing an integrated device, comprising the steps of: forming a first conductive region 220, 530; forming an insulating layer 201, 580 which coats said first conductive region; forming a through opening in said insulating layer above said first conductive region; forming a contact structure 214, 215, 230 that covers sidewalls of said through opening and a portion of the first conductive region that defines a bottom of said through opening, said contact structure comprising a conductive material layer 214, 215, 230 delimiting an empty region 333 that is open at a top end opposite to the bottom of said through opening ; and without previously depositing a filling material in the empty region, forming a second conductive region 560 that closes the top end of the empty region and delimits, together with the contact structure, the empty regions.

[Re claim 11] In the same teaching, Layadi discloses a process for manufacturing an integrated device, comprising forming a first conductive region; forming an insulating layer on the first conductive region; forming a through opening in the insulating layer above the first conductive region; forming a conductive material layer on walls of the through opening, the conductive material layer contacting the first conductive region, surrounding an empty region, and having a top opening that exposes the empty region; and without previously depositing a filling material in the empty region, forming a second conductive region 560 that closes the top end of the empty region and delimits, together with the contact structure, the empty regions (see Figs. 4-5).

[Re claims 2 and 12] Layadi discloses wherein said conductive material layer is obtained by depositing a titanium layer 214;

[Re claims 5 and 15] wherein said conductive material layer is obtained by depositing a titanium- nitride layer 215.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(a) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Layadi.

Layadi discloses substantially the limitations of claim 8, as shown above.

But it fails to disclose expressly the non conformal deposition of the second conductive region.

However, the examiner takes Official Notice that sputtering is a common deposition method conventionally used for depositing metal.

A person of ordinary skill is motivated to use sputtering to form the second conductive region to reduce equipment requirements.

Therefore, it would have been obvious to use Layadi's teaching to obtain the invention as specified in claim 8.

5. Claims 3-4, 6-7, 13-14, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Layadi, as applied above, in view of Doan.

Layadi discloses substantially the limitations of claims 3-4, 6-7, 13-14, and 16-19, as shown above.

But it fails to disclose expressly the details about the method of depositing Ti and TiN and their thickness and the opening width.

However, the missing limitations are well known in the art because Doan discloses or made obvious these features (see col. 7, lines 25-46).

A person of ordinary skill is motivated to modify Layadi with Doan to obtain reliable device.

Therefore, it would have been obvious to combine Layadi with Doan to obtain the invention as specified in claims 3-4, 6-7, 13-14, and 16-19.

6. Claims 9-10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (EP 0793274 A1, hereinafter "Jones") in view of Layadi.

Referring to Figs. 3-8 and related text, Jones discloses a process for manufacturing a ferro-electric memory comprising a transistor 51, 52, 56, 57 and a ferro-electric capacitor 92; forming a first conduction region 56 of said transistor in a substrate of semiconductor material; depositing an insulating material 61 on top of said substrate; forming a through opening in said

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insulating layer above said first conductive region; forming a contact structure in said through opening; forming a covering layer including a ferro-electric material region 922; forming a second conductive region comprising the first plate 921 between said covering layer and the contact structure, the ferro-electric material region 922 being deposited on top of said first plate, and forming a second plate 923 on top of said ferro-electric material region. Jones also disclose Pt electrodes for the capacitor (see par. bridging cols. 4-5).

But it fails to disclose expressly the details about the contact structure.

However, the missing limitations are well known in the art because Layadi discloses these features, as shown above.

A person of ordinary skill is motivated to modify Jones Layadi to obtain a reliable contact structure.

Therefore, it would have been obvious to combine Jones Layadi to obtain the invention as specified in claim 9-10 and 20.

#### *Allowable Subject Matter*

7. Claims 21-<sup>29</sup>~~38~~ are allowed.

Claim 21 recites "forming a horizontal portion of the conductive material layer that extends on top of the insulating layer and beneath the covering layer".

Claims 30-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 30 and 32 recite "wherein the conductive material layer of the contact structure includes a top portion that extends on top of said insulating layer and the second conductive region extends on top of the top portion of the conductive material layer" or "wherein the conductive material layer includes a top portion that extends on top of said insulating layer and the second conductive region extends on top of the top portion of the conductive material layer".

These features in combination with the other elements of the claims are neither disclosed nor suggested by the prior art of record.

Claims 22-29, 31, and 33 variously depend from claims 21, 30, or 32, they are allowed for the same reason.

### ***Response to Amendment***

8. In view of Applicants' amendment to the claims, the rejections of claims 21-29 under 35 U.S.C. 103, and the rejections of the claims over the combination of the applied reference with Doan and Ohba as stated in the indicated Office Action, have been withdrawn.

Applicants' arguments with regard to the rejections under 35 U.S.C. 102 or 103 of the remaining claims have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argued that Lapadi does not disclose a conductive material layer delimiting an empty region that is open at a top end...a second conductive region that closes the top end of the empty region and delimits the empty region. The examiner disagreed, even though in Fig. 5 of Lapadi, the empty region appears to be closed however at a large scale, shown in Fig. 4, the empty region is open at the top, it is closed by the trace 560 as shown in Fig. 5.

Therefore, Lapadi alone or in combination with Doan does teach or make obvious all the limitations of claims 1-20.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha T. Nguyen whose telephone number is (571) 272-1678. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week. The telephone number for Wednesday is (703) 560-0528.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ha Nguyen  
Primary Examiner  
8- 72- 05